GEOGRAPHIC SCHOOL BULLETINS

OF THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

NOVEMBER 14, 1955 VOL. XXXIV, NO. 7

Rural Improvements Boom Turkish Agriculture

"Thundering Smoke" Led Livingstone to Victoria Falls

Modern Cowboy Rides Beside His Legend

Mayas Earned Title of "New World Greeks"

The Lyrebird, Australia's Winged Mimic

SAMPLING TURKEY'S BOUNTY—Vineyards, Adding to Her Country's Farm Wealth, Spangle the Coastal Plain Around Izmir (Smyrna), International Trade Fair Site

TURKISH PRESS BUREAU

But changes are apparent in thousands of rural communities that the tourist is not likely to visit. The mutter of tractors, the grind and rattle of farm machines echo over golden wheat fields. Turkey used to import wheat. Now the nation ranks as the world's fourth-largest exporter of wheat and fifth-largest of cotton. Trench-digging machines snarl beside a distant barren pasture. This is an irrigation project carried out with United States aid to bring new acres into production and increase yield.

Not long ago, many such villages were isolated from each other. Now improved roads link them. Doctors can visit remote communities to check disease. Teachers are reaching into backward areas to cut down illiteracy. Trucks and busses bring the outside world to regions formerly served only by camel caravans.

This is the new Turkey, much of it the result of one man's leadership. When the enfeebled Ottoman Empire, once called the "sick man of Europe," crashed in ruins at the end of World War I, Mustafa Kemal, a former army colonel, emerged from the rubble to weld his countrymen into a republic. Atatürk, as he became known, freed Turkey from Moslem church law. He outlawed the fez, traditional Ottoman tasseled cap.

Atatürk also made women unveil their faces. He adopted Latin script to replace the old Arabic. He began the use of family names. He moved the capital from Istanbul to Ankara in central Anatolia and imported German architects to put up concrete and glass buildings.

These steps led Turkey away from oriental influence and molded a new, distinctive national character, a new philosophy of hope and confidence. Atatürk's purpose was not so much to "Westernize" Turkey as to make it, simply, "Turkish." Today that spirit has made Turkey a good investment for American aid. As a member of NATO the young republic holds a vital position in the free world's first line of defense. And just as important as its tanks and guns are its new factories turning out textiles, cement, paper, glass, and ceramics; its untapped minerals and unshackled water power.

There's a lot more to modern Turkey than Istanbul.

TURKS STUDY AMERICAN FARM MACHINERY
A New Tractor-Pulled Disk Plow Demonstrates Its Speed and Efficiency to Anatolian Farmers

MAYNARD OWEN WILLIAMS

National Geographic References

Map—Europe and the Near East (paper 50¢)

Magazine—June, 1952, "Where Turk and Russian Meet" (75¢); Aug., 1951, "Turkey Paves the Path of Progress" (75¢); July, 1948, "Peasants of Anatolia" (75¢); May, 1945, "The Turkish Republic Comes of Age" ($1)

School Bulletins—May 4, 1953, "Istanbul Celebrates 500th Turkish Birthday" (10¢)

PHILIP GENDREAU

GOLDEN HORN SPLITS ISTANBUL—Ships Dock near Galata Bridge with Cargoes for Turkey's Best-Known City. Golden Horn and Bosporus Lead to the Black Sea

Rural Improvements Boom Turkish Agriculture

Istanbul's pencil-point minarets and bulging domes are usually the first view the tourist gets of Turkey. Often he goes no farther. The old streets and buildings of this city the Greeks called Constantinople whisper of seven centuries of the Ottoman Empire's turbulent history. Thronging citizens—Istanbul has more than 1,000,000 of them—seem to tell all that needs be known about modern Turkey, a bulwark of democracy straddling the frontier between East and West.

Yet behind this romantic gateway city lies a 32-year-old republic about the size of Texas with South Carolina thrown in. Most of it forms the rectangular Anatolian peninsula, a link with Asia between the Black Sea and the Mediterranean. Another portion, west of Istanbul, looks like a lamb chop wedged against Greece and Bulgaria, north of the little Sea of Marmara (Marmara Denizi).

On both the vast Anatolian plateau, where summers are hot and winters frigid, and the small coastal plain, agriculture is still Turkey's big business—as in the old days of despotic Ottoman rule. More than three quarters of the nation's 23,000,000 people are supported by it, raising olives and such fruits as figs and grapes along the coast, a variety of grains, and some 62,000,000 head of livestock inland.

GEOGRAPHIC SCHOOL BULLETINS, copyright © 1955 by the National Geographic Society, John Oliver La Gorce, President. Published weekly during the school year by the School Service Division, Ralph Gray, Chief. Entered as second class matter, Post Office, Washington, D. C. International copyright secured. All rights reserved. Rates: United States, 75¢ for 30 issues (one school year); Canada, $1.00; elsewhere, $1.25. United States only, three years (90 issues) for $2.00. The National Geographic Society is a nonprofit educational and scientific society established for the increase and diffusion of geographic knowledge.

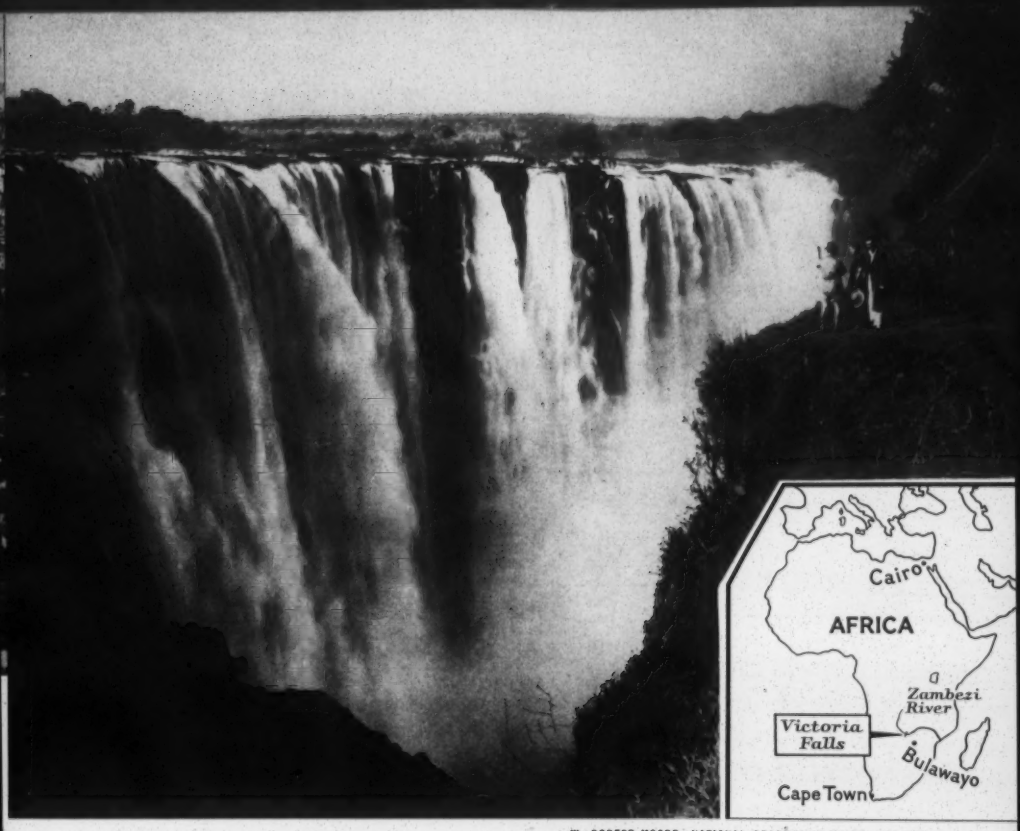
a mountainlike wall, high as the river's surface and only a few hundred feet opposite the falls. It seemed the earth had split like a slit envelope to make a gigantic trough for the Zambezi. Foaming and lashing, the imprisoned waters escaped through a single deep crack—the Boiling Pot —only 200 feet wide.

The adventurous missionary named the great wonder Victoria Falls for Britain's queen. After quickly planting a garden of apricot and coffee trees (long since felled by roaming hippos), he turned back, and the vast, remote African reaches again closed in on their lonely secret. But today, thousands of visitors see Victoria Falls, often from their train windows as they cross the gorge below. Those who want a longer look find a sparkling white hotel standing near by. A pint-sized, almost-hidden power station supplies electricity for the town of Livingstone, five miles away.

During April flood time, visitors see the smoke pillars from 70 miles off. Closer, a muffled roar takes over, like the constant hum of noonday traffic heard from a New York skyscraper. On the canyon's edge, amid a lush growth of palms and ferns called the Rain Forest, travelers stand in constant mist. Nowhere can they see the entire 1,900-yard length or 350-foot depth. Wider than Niagara and twice as high, Victoria is a poor second in average volume of water flow to its North American rival.

After his detour to Victoria Falls, Livingstone reached Africa's east coast, first white man to cross the continent. Years later, seeking the Nile's source, the aging explorer was feared lost until Henry M. Stanley, an American newspaper correspondent, met him at Ujiji on Lake Tanganyika's shore with the famous greeting, "Dr. Livingstone, I presume?"

MEETING IN UJIJI—After Stanley Found Livingstone, He Instructed an Artist to Make This Drawing, "as Correct," He Said, "as if the Scene Had Been Photographed"



W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF; NGS MAP

"Thundering Smoke" Led Livingstone to Victoria Falls

Sun dances on the languid Zambezi River as a group of fearful natives, huddling around their white leader, drift past tiny bush-covered islands. They cringe when smokelike columns loom some five or six miles away. A muffled roar, growing louder as they move downstream, breaks across the water, putting panic in their hearts. For never before had they ventured near *Mosi-oa-Tunya*, the "smoke that thunders."

Many times they had asked their leader, David Livingstone, "Have you smoke that sounds in your country?" The repeated question and veil of mystery shrouding the cloudlike columns had stirred Livingstone to seek their source a century ago this week.

The "thunder" grew almost deafening by the time the Scottish missionary-explorer landed and crept through brush and thick undergrowth to the edge of a midstream island on the very lip of the roaring falls before him. Never in his 15 African years had he seen such an awesome sight. Waters of the wide Zambezi swept past him into a giant gorge. Massive, snow-white sheets of water leaped clear of the rocky ledge, hurtled into the deep trenchlike chasm, and shattered on rocks far below.

Through shimmering mist, Livingstone watched water churn against

American legend.

It's a young legend—for the Chisholm Trail knew the jingle of spurs and the plod of longhorns only 90 years ago. But already the real cowboy has grown away from the legendary one. If he rides his fences now, they're apt to be electric, and he may be in a Piper Cub.

Often, though, the American cowboy still looks the way he should, not only in the movies and on TV, but in real life. For example, the top picture shows him cutting a cow out from the herd, letting his cayuse do the work as in the old days. He can still try to stick to a bronc (upper right), the way his grandpa did in earlier rodeos. There are still roundups and chuck-wagons to go with them (left). Probably today's cooks are a good deal better than the old-timers.

There's even a touch of romance, too, when the cowboy's day is done and he gathers at the campfire (below). The night is as clear as ever, the country as vast. On such evenings the legend becomes real.

RAY MANLEY FROM WESTERN WAYS

GENE MAGEE FROM WESTERN WAYS

Modern Cowboy Rides Beside His Legend

Cattle came to the New World about 30 years after Columbus—when the word "cowboy" was just a term cropping up in a few old Irish ballads. Conquistadors brought tough little Andalusian cattle and blue-blooded Barbary horses to Mexico. Gradually, huge Spanish haciendas stretched north on grassy Mexican tablelands. Herds ran wild. Vaqueros rounded them up for branding.

Frontiersmen from the infant United States began to drift into what is now Texas. From the Mexican vaqueros, they learned a new trade and forged a cattle kingdom. Their animals, tools, even words were Mexican: mustang, sombrero, poncho, corral, bronco, adobe, vigilante, vamoose, stampede, lariat.

Texas herds went north to Kansas to meet the railroad. Saddlebred cowhands, tough as leather, whooped at bawling, wild-eyed beef and ate dust from a million hooves. The cattle drives surged into Abilene, Ellsworth, Newton, Wichita, Dodge City, and the cowboy washed away the alkali dust, inside and out, and sometimes went for his six-gun as fast as he lost his temper. Right about then he turned into an American legend.

JIM ROSS

the city's big court—larger than a football field. Onlookers will crowd its walls and cheer themselves hoarse as half-naked athletes attempt to drive a hard rubber ball through a carved stone ring, set high in the wall. They use their elbows, knees, and hips, not their hands. Tradition says that if a player succeeds in scoring he wins the clothing and jewelry of every spectator. (Legend also has it that, in the event of a score, Maya fans vanish promptly to avoid payment.)

Another "entertainment" draws visitors to Chichén Itzá. One of the city's huge limestone-rimmed wells is the scene of a special ceremony performed in times of trouble—a drought, perhaps. Into the well hurtles a maiden—human sacrifice to the gods that control Maya destiny.

Rites and entertainments over, the populace goes back to simple thatched dwellings outside the city. (It has no "residential section".) Farmers will return to reap or plant crops (mostly corn) in fields cleared by the slash-and-burn method.

So ends the vignette of a single imaginary day at Chichén Itzá. But it gives no hint of the true scope of Maya culture—one of a number of intermingling Central American civilizations. Rising, flowering, and falling away, they left archeological treasures to be discovered and classified by field trips such as the nine National Geographic Society-Smithsonian Institution expeditions which have probed much of this area.

Long before Chichén Itzá was built, Maya farmers called upon their priests to help maintain food supplies and prevent famine. The priests tackled the problem by studying the turn of seasons—which led them gradually into astronomy. From observatories like that at Chichén Itzá they followed the path of heavenly bodies, advancing their knowledge far ahead of what Egyptians and Babylonians had accomplished across the world.

FROM A PAINTING BY H. M. HERGET, © NGS

These scholars delved even further, exploring the whole concept of time and developing a system for using and writing numbers five centuries before Hindu philosophers mastered the technique of handling Arabic numbers—which we use today. The Maya even understood the

WOMEN WOVE FINE CLOTH
Hip Looms Like This Are Still Seen in Guatemala. Modern Mayas Live in Similar Thatched Houses

UMI

FROM A PAINTING BY H. M. HERGET, © NGS

Mayas Earned Title of "New World Greeks"

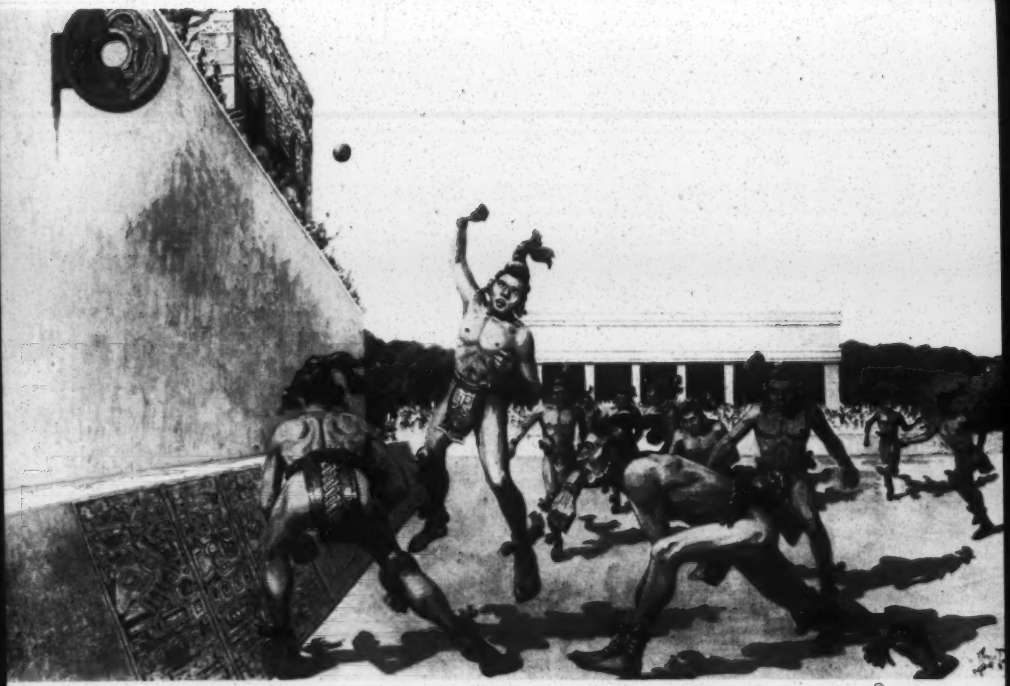
Imagine flying an airplane over the jungles of Guatemala or the Yucatán Peninsula, looking down, and seeing the tops of huge ruined buildings reaching up from among smothering tropical trees. Many lost cities of the Mayas, an Indian people whose culture is rated the most brilliant of ancient America, have been discovered just that way.

Exploring such ruins, archeologists have been able to piece together a jigsaw-puzzle picture of the Maya civilization that flourished in Central America from some 2,000 years ago to the time of the Spanish conquest. The painting above gives a good idea of what life was like in one of these cities—Chichén Itzá in northern Yucatán.

Priests and noblemen, gleaming with jade ornaments and proudly flaunting massive feathered headdresses, mingle with more simply clad warriors and farmers in a great plaza surrounding the observatory. In this round stone building, decorated with painted gargoyle heads, Maya astronomers take sightings on the movements of the sun, moon, and certain planets through slotlike openings in the thick walls. Add a dome to it and it would closely resemble such modern observatories as that at Mount Palomar, California (GEOGRAPHIC SCHOOL BULLETINS, Oct. 31).

In the background, other citizens throng the pyramidal temple of Kukulcan, the feathered serpent god. This strange deity has been introduced recently to Maya culture by fierce Toltecs from Mexico who now rule Chichén Itzá. The other structure, the rectangular Temple of the Warriors, draws a steady stream of pilgrims. They mount the stone steps to enter a hallway of carved columns painted in brilliant reds, blues, yellows, greens. Priests in jaguar skins worship amid burning incense.

Perhaps this same day there will be a wildly exciting ball game at



FROM A PAINTING BY H. M. HERGET, © NGS

THE DAY OF THE BIG GAME—Maya Cheering Section Gives Tongue as Straining *Tlachtli* Players Shoot for a Goal. Chichén Itzá Boasted Six Such Ball Courts

Chichén Itzá, Uxmal, and Mayapán mushroomed beside the great natural wells which provided them with water. As "city-states," reminiscent of ancient Greece, the three centers formed a league which prospered between roughly A.D. 1000 and 1200. Civil war split the confederation. Mayapán's ruler enlisted Toltec warriors as allies and turned conquered Chichén Itzá over to them.

The foreigners blended their own Mexican culture with the Mayan, and once more the city flourished, perhaps more brilliantly than ever. In those 250 years of foreign rule, more buildings went up in Chichén Itzá than since its foundation. But a new war finished the city. Though its people triumphed, they moved away from the Yucatán Peninsula. Less than a century later Hernán Cortés, Spanish explorer, stumbled across this branch of the Maya.

The white man's greed for gold wiped out Maya culture, leaving only hints for scholars to piece together. The sweeping picture that results is presented in the National Geographic Society's brilliantly illustrated new Indian book (see references). Today, the fewer than a million Mayas still grow corn. But they worship in Christian churches instead of the jungle temples that gave their ancestors the title, "New World Greeks."

Next week: *Aztec Warriors of Mexico*

National Geographic References: *Special new book*—"National Geographic on INDIANS OF THE AMERICAS, A Color-Illustrated Record." Twenty chapters present the whole sweep of aboriginal life gleaned from articles in *The National Geographic Magazine*. 262 full-color illustrations, including 149 paintings. 432 pages. $7.50 in U. S. and possessions; $7.75 elsewhere.

***Magazine*—**Nov., 1936, "Life and Death in Ancient Maya Land" ($1)
Nov., 1935, "Portraits of Ancient Mayas" ($1)

UMI

FROM A PAINTING BY H. M. HERGET, © NGS

SACRIFICE AT DAWN—If the Girl Lives until Noon, Mayas Haul Her from Chichén Itzá's Sacred Well to Learn the Future. If Not, They Hope Her Sacrifice Will Appease Gods Who Cause Drought

complicated idea of zero as it applies to mathematics.

Above all, they developed a calendar system, accurate to the day within a period of 374,400 years. Using symbols, Maya builders dated many of their monuments. Archeologists found one date that corresponds to A.D. 68 when Europeans were largely wandering barbarians.

As for the farmers, once they got accurate information about seasonal climates and the length of the year, they were able to raise bumper crops. Reserve supplies insured communities against famine. The need for constant work diminished. Mayas filled spare time by turning their hands to architecture, art, crafts. While Europe groped through the Dark Ages, Central America was raising lofty stone buildings, decorating them with carved stucco and paint. Temples with colonnades reminiscent of Greece and Rome topped terraced pyramids—reminders of ancient Egypt. Monasteries were built to house the priesthood. Observatories, of course, gained places of honor in the wide plazas of these jungle cities. Ball courts, vapor baths, carved monuments commemorating astronomical events were erected on or beside vast raised terraces.

Skilled craftsmen fashioned and decorated pottery—the finest of which was buried with Maya noblemen. Wood carvers shaped figures and faces of gods to be worn by priests.

Farmers, meanwhile, attacked their land with stone axes, ringing trees so they would die and burn. The trouble was that slash-and-burn agriculture does not replenish soil. Year after year fresh acres were cleared, many of them having never recovered fertility after former clearing and planting.

As land grew barren, this early Maya civilization, stretching from western Honduras westward through Guatemala and into Mexico, faded away. Writhing tropical plants twined over great cities. Many remained lost until recently—perhaps others still are to be found. New cities had been growing in Yucatán and here Maya culture's next stage focussed.

L. H. SMITH

The Lyrebird, Australia's Winged Mimic

Amid giant eucalyptus trees of Australia's eastern forests, the lyrebird, named for the lyrelike shape of its curving tail, imitates almost every sound it hears, from a dog's bark to the whir of a woodman's buzz saw.

Milliners once sought the filmy feathers to decorate ladies' hats. Today fashions have changed, and laws protect the species.

Lyrebirds rarely fly, but industrious females build nests from ground level to branches 80 feet up. They zigzag from limb to limb to reach feather-lined homes built during April, May, and June when Australia's autumn ends. The female lays only one egg a year, hatches her chick in the depth of winter.

The male lyrebird often leaves his feeding ground and builds an earth mound amid forest fern. Here he sings and prances in courtship with the less colorful female. His body usually is hidden beneath the widespread tail, a splendid creation of two side plumes, two whiplike feathers, and 12 filamentary feathers resembling a silvery parasol.

The lyrebird's own song is a strong, rippling call. Often he blends in notes of exotic neighbors—laughter of the kookaburra, flutelike notes of the butcherbird, harsh screeching of the black cockatoo. Long ago, hearing the effortless, flowing melody, listeners believed the lyrebird made music by moving tail feathers in the breeze.